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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/742,957	12/20/2000	Edward B. Gindele	82021RLO	8706
7590 06/16/2004				
Patent Legal Staff Eastman Kodak Company 343 State Sreet Rochester, NY 14650-2201		EXAMINER WU, JINGGE		
		ART UNIT PAPER NUMBER		
		2623		

DATE MAILED: 06/16/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/742,957

Applicant(s)

GINDELE, EDWARD B.

Examiner

Jingge Wu

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2004.  
2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9, 15-23, 49-51 and 57 is/are pending in the application.  
4a) Of the above claim(s) 57 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☐ Claim(s) 1-9, 15-23, 49-51 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. Applicants' response to the last Office Action, filed March 26, 2004 has been entered and made of record.
2. The dependency of claim 57 is not correct because claim 56 is cancelled. Correction is required.

**Remark**

3. Applicant's arguments with respect to claims 1-3, 5-9, 15, 18, and 49-51 regarding to Vuylsteke have been fully considered, but they are not persuasive.

a. Applicant argues that when Vuylsteke refers to a "residual digital image 31'" should be the "base digital image" used by Applicant and "detail digital image 31" should be the "residual digital image" used by Applicant. Thus, Vuylsteke filtering the residual digital image rather than base digital image as Applicant does. Therefore, Vuylsteke can not be read on the instant invention.

Examiner strongly disagrees the wrong assertion. In the instant case, first, Vuylsteke explicitly teaches pyramidal decomposition that "[a]fter the last decomposition step a residual image 31' may be left." (col. 7 lines 14-15). The residual image 31' is indeed the residual image mentioned by Applicant because the residual image 31' is the last image left from the decomposition process. In addition, Vuylsteke also explicitly teaches "the resulting detailed images 31, which represent the amount of local detail at successive resolution levels are next supplied to the pyramidal noise reduction section 32," (col. 7 lines 15-17). The resulting detailed images 31 (note that there are more than one images) are the base digital image mentioned by Applicant because the

resulting detailed images are the results of successive resolution decomposition with local noises needed to be reduced. Thus, Vuylsteke teaches what exactly Applicant does in term of decomposition of image and filtering the noise of base images. Finally, Vuylsteke further teaches producing a reconstructed enhanced image 4 by combining the noise reduced detail image 33 with the residual image 31' (fig. 3a and 3b, col. 7 lines 14-36). Applicant is urged to read Vuylsteke carefully and amend his claims accordingly.

b. Applicant further argues that "there is no motivation or suggestion in Vuylsteke to perform the claimed operations set forth in claim 1. Therefore, claim 1 defines a new and unobvious structure,".

In response to applicant's argument, Examiner would like to point out that claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Vuylsteke. Thus, there is no motivation or suggestion needed for 102 (b) rejection. As mentioned in section A, every element of claimed invention (claim 1) is shown explicitly and identically in Vuylsteke. Therefore, the rejection is proper.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 5-9, 15, 18, and 49-51 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5461655 to Vuylsteke et al.

As to claim 1, Vuylsteke discloses a method removing noise from a digital image comprising:

receiving an original digital image including a plurality of pixels (fig. 1, element 1);  
generating at least one residual digital image (31') and at least one base digital image (31) from the original digital image, the base image having a lower spatial resolution than the original digital image (fig. 3a-3b 30, col. 3-col. 4, col. 7 lines 8-56);  
generating a noise reduced base image by removing noise from the base image (fig. 3a and 3b, 33) so that the noise reduced image (33) is combined with the residual digital image to produce a reconstructed image, noise is not present in the reconstructed image (fig. 3a and 3b, 34, col. 3-col. 5 line 18, fig. 4b, col. 7 line 8-col. 8 line 34).

As to claims 2 and 3, Vuylsteke further discloses using the residual image and the noise reduced base image to produce the reconstructed digital image with same resolution (fig. 3b, abstract, col. 7 lines 8-56).

As to claim 5, Vuylsteke further discloses using noise removing filters (col. 8 lines 4-12).

As to claims 6-9, Vuylsteke further discloses generating an interpolated base image by spatially filtering the base image with an interpolation filter; generating the residual image (fig. 4a, col. 7 line 37-col. 8 line 12), calculating the difference of interpolated base image and original image (col. 8 lines 37-62); filtering the noise on the base image to create noise reduced base image, and combining the residual and base images to create reconstruction noise free image by adding residual and base images (col. 8 line 13-34, col. 13 line 25-14).

As to claim 15, Vuylsteke further discloses the noise reduction filter further includes steps of:

identifying the pixel of interest and its neighborhood, calculating the difference of pixel values of the interested pixel and the pixels of neighborhood, using the absolute difference value (variance) to calculate the noise reduction pixels value; and replacing the value of the pixel of interest with the noise reduced pixel value (col. 8 line 37-col. 12 line 60, ).

As to claim 18, the filters is adaptive and changes in response in the local neighborhood of pixels (col. 8 lines 37-62, moving average operation of 15X 15, col. 13 line 25-14, the filter can be view as a sigma filter).

As to claims 49-50, Vuylsteke further discloses noise filtering on the base, and original images (fig. 3a, 3b, and 5). Other limitations are addressed with regard to claims1-3.

As to claim 51, the claim is the corresponding computer storage medium claim to claim 1, the discussions are addressed with regard to claim 1.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4, 16—17, 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vuylsteke.

As to claim 4, Vuylsteke does not explicitly mention the reconstructed image has a lower spatial resolution as that of the original image but mentions the reconstructed image could be close approximation of original image (col. 5 line 1-7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use scheme of Vuylsteke to create lower resolution reconstructed image by adding less base images to residual image to achieve the purpose reduce noise and resolution at same time.

As to claim 16-17, Vuylsteke does not explicitly mention the thresholding scheme.

Examiner takes Official Notice that this feature is notoriously well known in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the thresholding scheme to reduce the noise level and computation level for the noise reduction.

As to claims 19-23, Vuylsteke does not explicitly mention median filter, bilinear interpolation filter, bicubic interpolation filter, and original color image, etc.

Examiner takes Official Notice that those features are notoriously well known in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use those features in the method of Vuylsteke in order to achieve fast computation and less noise on the color image.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

#### **Contact Information**

9. Any inquiry concerning this communication or earlier communications should be directed to Jingge Wu whose telephone number is (703) 308-9588. He can normally be reached Monday through Thursday from 8:00 am to 5:30 pm. The examiner can be also reached on second alternate Fridays.

Any inquiry of a general nature or relating to the status of this application should be directed to TC customer service whose telephone number is (703) 306-0377.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Amelia Au, can be reached at (703) 308-6604.

The Working Group Fax number is (703) 872-9314.

Jingge Wu

Primary Patent Examiner

